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Painting Altamira Cave? Shell tools for ochre-processing in the Upper Palaeolithic in northern Iberia

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ABSTRACT

Much of our knowledge of the symbolic world of Upper Palaeolithic hunter-gatherers is based on the study of the graphic representations found in Western European caves. However, to date, few studies have been conducted on rock art apart from chronological and stylistic characterisation. Altamira Cave (northern Iberia) is characterised by an outstanding rock art ensemble, whose representations cover practically the whole Upper Palaeolithic. The site is equally important for the rich Upper Palaeolithic deposits in the cave entrance, which contain large shell assemblages. Traditionally, the presence of shells in hunter-fisher-gatherer settlements has been interpreted as part of the diet and/or the symbolic world (through the creation of ornaments) of these groups, regardless of their possible use as an instrument. In this paper we utilise use-wear methodology, chemical analysis and analytical experimentation to verify the initial hypothesis that shells in the archaeological deposits of Altamira were used to obtain the ochre powder utilised to produce the magnificent and diverse rock art ensemble in the cave. The results provide new information on the process of obtaining pigments for the realisation of paintings and confirm that the use of shells to obtain ochre was a systematic activity throughout the whole study period. Finally, our conclusions support the explanatory model that highlights the role played by marine resources for Upper Palaeolithic human populations.

1. Introduction

Despite the fact that Palaeolithic art is a key element in debates on the origins of symbolic behaviour in humankind, our knowledge of the symbolic world of Palaeolithic hunter-gatherers is still relatively limited. For some researchers, this behaviour is linked to the appearance of *Homo sapiens* (Bar-Yosef, 2002, 2007; Klein, 2000; Mellars, 2005). In contrast, others have proposed that symbolism and artistic expression were already quite well-developed among Neanderthal groups (Soressi and d'Errico, 2007; Vanhaeren and d'Errico, 2006; Zilhao, 2007). In any case, Palaeolithic art has become a diagnostic element to determine the origins of symbolism, language, music and creativity (d'Errico et al., 2003; Mithen, 1998; Turner, 2006). The use of pigment, not only in connection with the painting of graphic representations in caves, has been repeatedly associated with the origin of symbolic behaviour in the first anatomically modern humans (Bar-Yosef Mayer et al., 2009; Henshilwood et al., 2011).

Evidence of Palaeolithic rock art has been found in many areas of Western Europe. More than 200 sites have been recorded in Iberia, mostly in caves, but examples of open air sites also exist (e.g. Foz Côa and Siega Verde in central Iberia). More than half of the cave sites have been identified in the Cantabrian region (northern Spain) with a chronology ranging around c. 30–11 ka (Bicho et al., 2007). Despite the occurrence of regional variations there are great similarities regarding the graphic representations in the whole Franco-

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Cantabrian area (i.e. including Cantabria, but also some areas of France), suggesting the existence of common symbols and beliefs, as well as contacts between populations. Graphic activity has been used as a basic argument to propose the existence of cultural identity shared by human groups from the Cantabrian region, the Pyrenees and Aquitaine during some periods, particularly the Late Magdalenian 14.5–11.5 ka (Sauvet et al., 2008; Ruiz-Redondo, 2014) although these areas have their own specific features in terms of techniques and motifs. The distinctive characteristics of the Cantabrian region include the distribution of some animal figures, the presence and importance of particular abstract (non figurative) signs, and the continued graphic activity at the sites for a longer time span (González Sainz, 2007a). One of the most representative sites with rock art in the Cantabrian region is Altamira Cave (Cantabria, Spain) (Fig. 1), where Palaeolithic graphic representations were identified for the first time (Cartailhac, 1902). The cave contains a complete and diverse rock art ensemble (Fig. 2), dated to the Gravettian, Solutrean and Middle/Lower Magdalenian (~26–17 ka cal BP). The studies at the cave were crucial in defining the chronological sequence of Upper Palaeolithic art from both a stylistic perspective (Breuil and Obermaier, 1935) and also through radiocarbon datings (Valladas et al., 1992). Recent studies have suggested the existence of Aurignacian paintings through U/Th datings. Therefore, after more than a century of investigations, the cave is still at the centre of the debate on the origins of human symbolic capabilities (Pike et al., 2012; Pons-Branchu et al., 2014).

Following a series of studies carried out in the cave since 1903 (Alcalde del Río, 1906; Cartailhac and Breuil, 1906; Breuil and Obermaier, 1935; Freeman et al., 1987; Freeman and González-Echegaray, 2001), the chronology of the human settlement has recently been re-defined through C14-AMS dating, placing the occupations in the same time period as the paintings, between the Gravettian and the Lower Magdalenian (Lasheras et al., 2012) (Table 1). Some of the first studies related to the rock art were focused on the technical processes involved in the production of the paintings, identifying pigments, bone airbrushes, shell palettes and ochre pencils (Cartailhac and Breuil, 1906; Breuil and Obermaier, 1935), and applying physical-chemical analysis to determine the components of the pigments (Pietsch, 1964). However, little research has focused on relating the production of Palaeolithic art with the chain of technical operations involved in obtaining the pigment. This aspect has rarely been considered since the pioneer study at Lascaux (Couraud and Laming-Emperaire, 1979), unlike the phases of mixing and application of the paint, which have received greater attention (Clottes et al., 1990; Lorblanchet, 1995).

Fig. 2. Partial view of the Ceiling of the Paintings in Altamira Cave. © P. Saura/Altamira Museum.

In the last few years, use-wear analysis has been successfully used to understand the role of technology in the rock art production process (d'Errico and Sacchi, 1995; Álvarez et al., 2001; Beyries and Cattin, 2015; among others), the manufacture and suspension of shell beads (d'Errico et al., 1993; d'Errico et al., 2005; Vanhaeren et al., 2013) and the use of shells as tools (Henshilwood et al., 2011; Joordens et al., 2015). Numerous ethnographic accounts describe the use of shell tools by human groups in many different places (see Cuenca-Solana et al., 2011 for a summary). Although little studied, the use of shells as tools in the Palaeolithic is not totally unknown. To date, the oldest reference is associated to *Homo erectus* in Indonesia and dates back about 1.5/1.6 mya (Choi and Driwantoro, 2007). In Europe, there is evidence from the Middle Palaeolithic, both in Italy and Greece (Cristiani et al., 2005; Douka and Spinapolice, 2012; Romagnoli et al., 2015; Stiner, 1999, 2001) and from the Upper Palaeolithic in the Iberian Peninsula (Cuenca-Solana, 2013, 2015). Recent studies have shown that, among other uses, shells were employed to obtain the colouring powder (i.e.

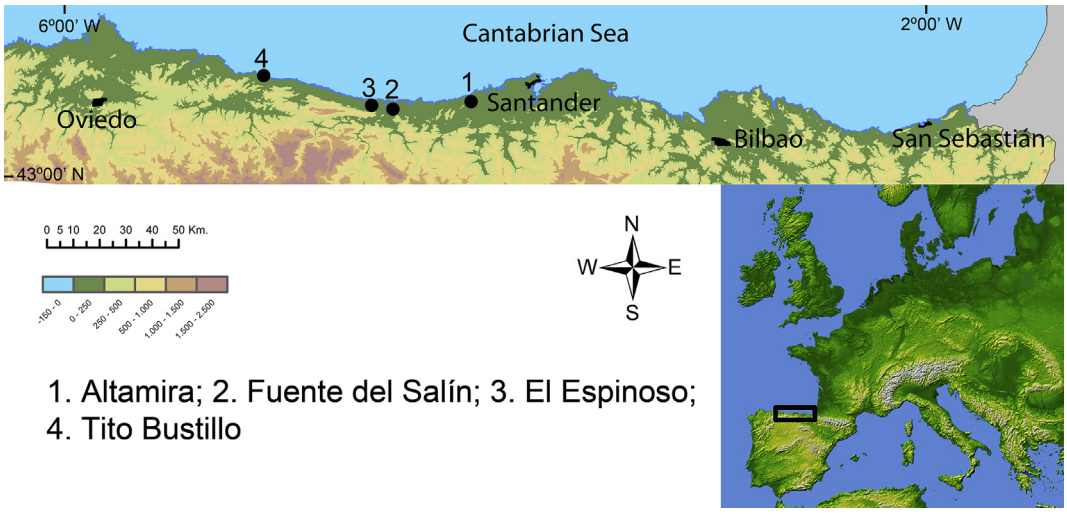

Fig. 1. Location of Altamira Cave and other sites mentioned in the text.